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XXX.—*On the Genera* Nototherium *and* Zygomaturus, *in reply to Mr. Lydekker.*

Queensland Museum, Brisbane,
May 21, 1889.

To the Editors of the Annals and Magazine of Natural History.

GENTLEMEN,—

Permit me to offer some observations on Mr. Lydekker's view of *Nototherium* and *Zygomaturus.*

For the behoof of those who may be interested in the dispute I beg leave to place at your disposal a cast of the maxilla twice referred to in my remarks [*], and to be

Yours most respectfully,
C. W. DE VIS.

IN the skull to which it is proposed to restore Macleay's name *Zygomaturus* are two premolars—the one on the right side well preserved and complete though worn, the other, taken by itself, in a condition less conducive to safe interpretation. Mr. Lydekker, in his late attempt to set aside my reasons for separating *Zygomaturus* from *Nototherium*, acknowledges that I am right in attributing to the latter a $\underline{\text{pm. }4}$ triangular in shape, and is thus driven to admit that the right tooth of this skull is not a *Nototherium* premolar. The former admission he is ready to make probably because it seems to enable him to deal the blow which, as he phrases it, leaves me without a leg to stand on. He claims to have discovered by careful examination a fact which eluded the scrutiny and stultifies the judgment of Sir Richard Owen, namely that the true premolar of the skull is not the right but the left tooth, and this he asserts to be of the triangular shape demanded. Can anything more be required to prove that this skull is beyond doubt *Nototherium*?—possibly, as we may see later on.

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[*] [The cast has been presented to the Geological Department of the British Museum (Natural History).—EDS.]

But first, What of the unfortunate tooth so ignominiously dismissed? We are gravely instructed that this may be: 1st, an abnormality; 2nd, a pseudohomologue; 3rd, a deception; 4th, a milk-tooth—verily a quartette of the most volatile assumptions ever accruing from the resolution of a "too, too gross" fact! Grant the tooth an abnormality—then, as it occurs again in the maxilla from which I have figured it and a third time in a third example procured of late, we are led by it to the *reductio ad absurdum* "constant abnormality." If it be not homologous with its fellow of the opposite side, which tooth of the opposite side is in reality its homologue?, in other words, which dilophodont tooth should be made to pair off with this forlorn bunodont? We ought not to be left in the dark on so interesting a point. Is it an "insertion" fraudulent or accidental "from another skull"?

Then, in two examples at least we have evidence that the deception was set afoot by some practical joker or mysterious agency in the Drift period for the confusion of a latter-day disputant. As to its being a milk-tooth retained to old age, the age impressed upon the posterior molars, and that in a family long known to have been without milk-teeth, very good evidence indeed in support of such a notion must be forthcoming before it is likely to be accepted. Moreover, it involves another abnormality—milk-teeth and their successors are in Marsupials always, I believe, of the same type, differing in size, sculptural details, and, to a less extent, in shape, but not in general form and plan of structure, for an oval tubercular tooth to be succeeded by a triangular unicuspidate one would certainly be an anomaly. But, to protect Mr. Lydekker from this particular illusion in the future, I have resorted to the crucial test, and, opening the maxilla at my disposal, find no trace whatever of successional tooth or formative chamber in the position they should occupy. In proof of this I forward for inspection a cast of the maxilla examined.

Surely the very number and violence of these hypotheses should have warned a judicious observer against the validity of an apparent fact, however specious, which threatened to compel him into their toils.

And now what is the fact? and is it so patent, so specious even, as to leave us no alternative but to accept it at any cost?

Of the original skull in the Australian Museum, Sydney, two editions of casts have been issued, one immediately after its discovery and before the matrix had been efficiently cleared from the surface, the other at a recent date after skilful development of details. The former, as may be supposed, is an unreliable exponent of its original—for example, it obscures by a ridge representing unremoved matrix one of the characteristic features of the very tooth in dispute. Of this edition is the copy in the British Museum, a copy not rendered more trustworthy by having been "restored."

Waiving this general objection to Mr. Lydekker's source of information, an objection which, had he been aware of it, might have deterred him from his fatal tilt against a difficulty of his own creation, I will take up his parable on his own ground. The left tooth, he says, is triangular (rudely subtriangular I should call it) and shorter than the succeeding molar. Now if Mr. Lydekker accepts my determination of the shape of the *Nototherium* $\frac{\text{pm. 4}}{}$, he must in fairness accept also my description of its structure or give reasons for rejecting it. Of structure in relation to the tooth in question he wisely says nothing. The crown of the *Nototherium* tooth is a single elevated subtriangular cusp rather deeply emarginated on its posterior side and wearing down to a bitriangular tract of enamel-edged dentine. The cast of the *Zygomaturus* tooth (a very young tooth according to Mr. Lydekker's favourite hypothesis) shows a crown flatly depressed and broken up into several eminences; near the fore end of the tooth in its present state one of these eminences is formed by a conical flat-topped tubercle (its flatness the result of wear) corresponding to the anterior of the external tubercles of the fellow tooth; behind it on the outer side is another eminence corresponding to the posterior tubercle of that side in the homologous tooth; the two tubercles of the inner posterior region are concealed by a ridge-like remnant of matrix, as before intimated; the anterior basal tubercle is missing, lost probably by the same accident which removed a large chip from the inner anterior surface below the base. This loss is the main cause of the apparent shortness of the tooth; but this again is also partially due to absorption of the posterior basal talon resulting from pressure in the rear. In short, the tooth before me is nothing but the somewhat mutilated, somewhat abbreviated, and somewhat disguised homologue of its fellow. Most assuredly it is not the tooth of *Nototherium* as known to me. Such is the ground, treacherous in itself and sadly misunderstood, which allowed my critic to sink into a veritable slough of surmise.

To my question respecting the maxillary fossils which occur in frequency corresponding to that of the numerous mandibles of undoubtedly Nototherian origin, Mr. Lydekker responds somewhat inconsiderately to the effect that these "crushed *Diprotodon*-like skulls" (all these terms are his own and unwarranted) may indicate "young individuals or a small species of *Diprotodon* itself." If this be so, nothing remains for me but to unlearn and relearn, if possible, the means of distinguishing between old and young *Diprotodons*, or, perhaps, in course of time to describe a "small *Diprotodon*" with its posterior incisors on the edge of the jaw.

This would not be a difficult feat for one prepared to say that *Owenia* is probably a "small form of *Nototherium*," that is of *Zygomaturus*, since in Mr. Lydekker's judgment a form with reduced dentition, small narrow nasals, elongated muzzle, and slender jugals may be one generically with a form antithetical to it in these and many other respects. Mr. Lydekker has very liberal ideas of the amount of differentiation sometimes required for the establishment of a genus.

With respect to the name *Owenia*, Mr. Lydekker remarks that it is preoccupied three deep in the Invertebrates, leaving it to be inferred that this also is a discovery of his own; it is a distinct act of unfairness (unintentional I should be willing to think) not to state that I called attention to the fact while pleading that under the circumstances the name might be accepted.

Minor blemishes, such as terming my rejoinder to his footnote in the B. M. Cat. of Foss. Mamm. a reopening of the question, I pass over, with merely a word on the "untenable proposition," which proposition briefly is that when a type lacks a requisite characteristic that one of the proposer's cotypes which does possess the characteristic required should for practical purposes be taken as the typical example. This seems to me to recommend itself to common sense. It may be observed that Mr. Lydekker himself holds the untenable by resting his case not on the molars of the type, but on the shape of the premolar deduced from that of the cotype.

On the whole I have to thank Mr. Lydekker for his criticism; it has relieved me of a foolish fear that, in spite of improbability, the British Museum might possess some positive evidence in natural association of parts that *Zygomaturus is Nototherium.* I am comforted to find that the hypothesis remains in its pristine purity, also to think that if no better attack upon my position can be made than that which I have met it is pretty secure. An utter failure to show that the right tooth is not the $\frac{\text{pm. 4}}{}$ proper to the skull, together with the confession that it is not the premolar of *Nototherium*, might well have released me from any obligation to cut Mr. Lydekker's Gordian knot.

Queensland Museum,
April 15, 1889.

XXXI.—*Note on the Above.* By R. Lydekker.

Being extremely unwilling to enter into any prolonged controversy on this or any other subject, my remarks on the foregoing communication will be of the briefest nature.

If the author be right in his contention that the first cheek-tooth on the right side of the cranium to which the name *Zygomaturus* was applied is homologous with and similar to the corresponding tooth on the left, then there may be evidence that this skull is specifically distinct from the form to which Sir R. Owen gave the name of *Nototherium inerme.* This, however, would be very far from proving that these two forms are widely different and have a totally distinct type of appendicular skeleton. Moreover, if it be assumed that the so-called *Zygomaturus* is widely different from that type of cranium to which the author would restrict the term *Nototherium*, we are confronted with the difficulty that while, with one exception, all the complete maxillæ in the British Museum appear referable to *Nototherium*, all the mandibles seem to be of the type of *Zygomaturus.*

In conclusion, I cannot pass over the author's extraordinary statement that the milk-teeth of Marsupials are always similar in structure to their successors, when, as is well known, precisely the reverse is the case. Thus we have only to cite the case of many of the Kangaroos, where a molariform $\frac{\text{mm. 4}}{}$ is succeeded by a secant $\frac{\text{pm. 4}}{}$. This ignorance of such a well-known feature among existing forms is not calculated to raise one's estimation of the author's acumen when he has to face the more difficult question of the structure and affinities of extinct types.